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El-Zehiry et al.(10) **Pub. No.: US 2022/0092773 A1**(43) **Pub. Date: Mar. 24, 2022**(54) **IDENTIFYING THE QUALITY OF THE CELL IMAGES ACQUIRED WITH DIGITAL HOLOGRAPHIC MICROSCOPY USING CONVOLUTIONAL NEURAL NETWORKS**(52) **U.S. Cl.**  
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**G06K 9/62** (2006.01)(71) Applicant: **Siemens Healthcare GmbH**, Erlangen (DE)(72) Inventors: **Noha Youssry El-Zehiry**, Plainsboro, NJ (US); **Saikiran Rapaka**, Pennington, NJ (US); **Ali Kamen**, Skillman, NJ (US)(21) Appl. No.: **17/457,716**(22) Filed: **Dec. 6, 2021****Related U.S. Application Data**

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(57) **ABSTRACT**

A system for performing adaptive focusing of a microscopy device comprises a microscopy device configured to acquire microscopy images depicting cells and one or more processors executing instructions for performing a method that includes extracting pixels from the microscopy images. Each set of pixels corresponds to an independent cell. The method further includes using a trained classifier to assign one of a plurality of image quality labels to each set of pixels indicating the degree to which the independent cell is in focus. If the image quality labels corresponding to the sets of pixels indicate that the cells are out of focus, a focal length adjustment for adjusting focus of the microscopy device is determined using a trained machine learning model. Then, executable instructions are sent to the microscopy device to perform the focal length adjustment.

